

**Remarks**

Applicants have received and carefully reviewed the Office Action mailed December 8, 2006. Claims 1-9 and 21-31 are pending. Reconsideration and reexamination are respectfully requested.

**Rejection under 35 U.S.C. § 103(a)**

Claims 1-9 and 21-31 are rejected as being unpatentable over Wise et al. (US 6,838,640), Rounbehler et al. (US 5,300,758), and Philips et al. (US 5,196,039). Applicants respectfully traverse the rejection.

As in the previous Office Actions, the Examiner has listed numerous case citations stating that the motivation for combining references may be provided by clear scientific reasoning or knowledge generally available to one of ordinary skill in the art. Applicants do not question this. What Applicants have repeatedly requested is that the Examiner explain and/or support the assertions that one would have been motivated to combine the teachings of Wise et al., Rounbehler et al. and Philips et al. The Examiner has again merely restated various case law citations and asserted that the clear scientific reasoning is found "in the rejections below". However, Applicants have reviewed the actual rejections and have not found such reasoning.

In the actual rejections, the only statements of obviousness are as follows:

It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ more than one concentrator connected to one another, as taught by Rounbehler et al., modifying the fluid analyzer disclosed by Wise et al., thus providing means to permit rapid concentration of vapors (Rounbehler et al.: col. 2, lines 28-31).

Emphasis added; see page 8, lines 2-5 of Office Action mailed December 8, 2006. Thus, it appears the Examiner is asserting that one of ordinary skill in the art would have been motivated to combine Rounbehler et al. with Wise et al. for the purpose of permitting rapid concentration of vapors. However, Wise et al. already teach their device as including a multi-stage pre-concentrator 28, thus it appears concentration of vapors is already provided for in Wise et al. It is not clear how adding additional concentrators to the Wise et al. device would provide means to

permit rapid concentration of vapors over the means already provided by the pre-concentrator taught by Wise et al. Alternatively, if the Examiner is asserting that one would substitute a concentrator of Rounbehler et al. for that of Wise et al., there does not appear to be motivation for such modification. Applicants respectfully request the examiner clarify the rejection and the basis of the obviousness assertion.

It would appear that making the Examiner's asserted modification to the Wise et al. device would result in a duplicated structure. Applicants submit that there is no motivation in the cited references, common knowledge or common sense of a person of ordinary skill in the art to add the concentrators of Rounbehler et al. to the device of Wise et al. that already has a multi-stage pre-concentrator. The Examiner's re-statement that Rounbehler et al. teaches their device as providing means to permit rapid concentration of vapors does not provide any indication of why one of ordinary skill in the art would have been motivated to modify the device of Wise et al. which appears to already provide rapid concentration of vapors. Applicants are merely requesting the Examiner provide some indication of why the skilled artisan would have been motivated to make a change that appears to provide a duplicate structure.

While Rounbehler et al. does teach their system of two series-connected vapor concentrators as permitting rapid concentration of vapors, Rounbehler et al. teaches that this is "achieved at high speed by electrical circuitry which provides rapid, precise heating of VC1, VC2, GC1, and GC2." See column 2, lines 32-34. Rounbehler et al. later describes the rapid, precise heating:

The outer metal tube is also connected to a source of electric power for controlled, very rapid resistance heating of the metal tube- for example, from about 10°C. to 250°C. in about *one second*. This very rapid heating, preferably accomplished automatically under programmed control...is continually monitored and employed as a feedback parameter in controlling the power applied to the tube

Emphasis added; see column 5, lines 3-11. Rounbehler et al. thus appear to teach a device in which sufficient power is needed to achieve very rapid heating (240°C in *one second*) of the gas in order to concentrate the vapors. In contrast, Wise et al. teach "a low-power, battery-operated,

temperature-programmed fast  $\mu$ GC" to "achieve a temperature rise of 100°C in 200 sec."  
Emphasis added; see column 5, lines 33-34 and 26-29. The device of Rounbehler et al. thus appears to require a strong power source to achieve the very rapid heating required for the concentrators as opposed to the low-power, slower heating device of Wise et al. Applicants submit that in view of the significantly faster heating required for the concentrators of Rounbehler et al., one of ordinary skill in the art would not have been motivated to look to the teachings of Rounbehler et al. regarding a high-power, high-speed system, to modify the low-power, battery-operated device taught by Wise et al. Further, the low-power, battery-operated device of Wise et al. would not appear to achieve the very rapid, precise heating required to achieve the rapid vapor concentration of Rounbehler et al.

The Examiner states, "The fact that the power requirements are different from one Prior Art device to another is irrelevant." The Examiner appears to be considering that no matter how different power requirements may be and how different temperature change requirements may be between devices, all modifications would be necessarily obviousness. Applicants strongly disagree. While minor changes in power requirements may be obvious, Applicants submit that the difference between the power needed to achieve a temperature rise of 100C in 200 seconds (Wise et al.) is significantly different that the power needed to achieve a temperature change of 10C to 250C in one second (Rounbehler et al.). Further, Applicants are not asserting that one could not combine the teachings of Wise et al. and Rounbehler et al., but that there is no motivation such that one would desire to combine the teachings. Applicants acknowledge that, given suitable teachings and motivation, one of ordinary skill in the art can make many modifications regarding power requirements to various devices. However, the key is the motivation and desirability of making those modifications. Wise et al. and Rounbehler et al. do not provide any such motivation, and the Examiner's only assertion of motivation is a statement in Rounbehler et al. regarding what their device is capable of doing. Applicants submit that even when the individual elements of a claim are found in various pieces of prior art, the Examiner must still provide a reason why one of ordinary skill in the art would have been motivated to make the combination. Applicants submit that in view of the significantly faster heating required

for the concentrators of Rounbehler et al., one of ordinary skill in the art would not be motivated to add a concentrator as taught by Rounbehler et al. to the low-power, battery-operated device taught by Wise et al.

Further, even if one were to attempt such a combination, it is not clear how the teachings would be combined. In particular, it is not clear how the very rapid heating that appears to be required in the concentrators of Rounbehler et al. would be incorporated into the low-power, battery-operated, low thermal mass structure of Wise et al. The Examiner asserts that the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference, rather the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. The Examiner also asserts that one of ordinary skill in the art would be able to employ the teachings/methods of the prior art in any type of device, miniature/micro or otherwise. The Examiner has not, however, provided any indication of how the complex heating and concentrating elements of Rounbehler et al. could be achieved or incorporated into the low-power micro device of Wise et al.

The Examiner asserts that "one of ordinary skill in the art would clearly be motivated to employ the specific teachings of the Prior Art references and make the proper combination as a result of their teachings and disclosures." Applicants respectfully submit that such statements do not provide any indication as to why one would desire to combine the teachings of Wise et al. and Rounbehler et al.

Additionally, Applicants submit that even if one were to combine the teachings of Wise et al., Rounbehler et al., and Philips et al., there is no reasonable expectation of success in making such a combination. As stated above, Wise et al. teach a low-power, battery-operated device that achieves an increase in temperature of 100C in 200 seconds, whereas Rounbehler et al. teach a device that appears to require an increase in temperature from 10C to 250C in one second. It is not clear how concentrators such as those disclosed by Rounbehler et al., apparently requiring very rapid heating, would be incorporated into a device such as that disclosed by Wise et al. The Examiner asserts that the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference, but

rather what the references would have suggested to one of ordinary skill in the art. Applicants submit that the Wise et al. and Rounbehler et al. references appear to teach significantly different heating and timing requirements, and that one of ordinary skill in the art, upon reading both Wise et al. and Rounbehler et al., would have no motivation or reasonable expectation of success in attempting to combine the teachings. It would appear that, in order to incorporate the overall teaching of Rounbehler et al. of using concentrators for the Examiner's asserted advantage of permitting rapid concentration of vapors, would require the very rapid heating disclosed by Rounbehler et al. As Wise et al. already teach a multi-stage pre-concentrator 28 in a device that is low-power and battery-operated, there does not appear to be any expectation of success in modifying such a low-power, battery-operated device to achieve the very rapid heating apparently required by the concentrators of Rounbehler et al. Further, there does not appear to be any reasonable expectation of success in adding concentrators that appear to require very rapid heating, such as those disclosed by Rounbehler et al., to the device of Wise et al. that already includes a multi-stage pre-concentrator.

In the previous responses, Applicants cited MPEP 2143.01 as stating that the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. It does not appear that the Examiner has addressed this argument. As discussed above, the Examiner has repeated the assertion that motive is found in Rounbehler's statement that their device provides means to permit rapid concentration of vapors. However, in response to this assertion Applicants have provided arguments that Wise et al. appears to already provide for the rapid concentration of vapors. The Examiner has not addressed this argument and merely repeats the original obviousness statement. Applicants once again request the Examiner respond to the argument that Wise et al. already provides for rapid concentration of vapors and as such, combining Wise and Rounbehler would appear to provide a duplicate structure.

It appears that the Examiner is asserting that one of ordinary skill in the art would have been motivated to modify the system of Wise et al. with the teachings of Rounbehler et al. because doing so would have been possible for the skilled artisan. The Examiner's asserted

Application Serial No. 10/672,483  
Response to Office Action mailed December 8, 2006  
Amendment dated , 2007

reason of combining the references "to permit rapid concentration of vapors" would appear to already be provided by the system of Wise et al. Thus any combination of Wise et al. and Rounbehler et al. would appear to result in the duplication of elements. Applicants submit that duplicating an element or function would not appear to provide the necessary motivation for combining references and establishing a *prima facie* case of obviousness. Further, the mere fact that one of ordinary skill in the art could add a concentrator according to Rounbehler et al. to perform the same function as the elements already taught by Wise et al., does not provide the necessary motivation or suggestion to make such a combination.

The Examiner asserts that one of ordinary skill in the art would be well aware of any type of power source and its subsequent employment in any fashion, and that simply because one reference uses low-power and another appears to use a higher power is not sufficient to negate their combination. Applicants respectfully disagree. As the Examiner states, the test for obviousness is what the references would have suggested to one of ordinary skill in the art. MPEP 2143.01 clearly states that the mere fact that references can be combined does not satisfy the motivational requirement for a *prima facie* obviousness rejection. While one of ordinary skill in the art may be well aware of both low- and high-power systems for heating, Applicants submit that the Examiner must still provide motivation for why one of ordinary skill in the art would have been motivated to make the asserted modification. In the absence of any asserted reasoning, logic, or suggestion for making the asserted modification, the only source appears to be the instant specification, which is improper. Applicants submit that, while one of ordinary skill in the art may understand that the low-power, battery-operated device of Wise et al. could be modified to include the concentrator and a very fast, high-power heating device required by the concentrator, as taught by Rounbehler et al., there is no indication of why one would make such a combination. Wise et al. already teaches a pre-concentrator in their device. Applicants are merely requesting the Examiner to provide some indication of why one would have desired to modify Wise et al. with Rounbehler et al.

Additionally, it appears that modifying the low-power, battery-operated device of Wise et al. to include the concentrator of Rounbehler et al. may result in an inoperative device because

the power and very rapid heating requirements of Rounbehler et al.'s concentrator do not appear to be met by the low-power, battery-operated device of Wise et al. Alternatively, it would appear that further modifications to the device of Wise et al. would be required in order to achieve the very rapid heating required by the concentrator of Rounbehler et al., which would appear to destroy the low-power, battery-operated portability of the Wise et al. device. Applicants submit that neither Wise et al. nor Rounbehler et al. provide motivation for their combination, and actually teach away from such a combination. The only motivation appears to come from Applicants' own specification, which is improper.

In the Response to Arguments section on page 4, lines 13-15, the Examiner stated, "the Examiner must present a clear scientific reasoning, along with proper motivation which is found in the Prior Art, and which is clearly indicated in the rejections below." Applicants have reviewed the actual rejections in the Office Action and have found no clear scientific reasoning. The Examiner is respectfully requested to specifically point out in the next Office Action where such scientific reasoning has been provided in the previous rejections.

Further, if the Examiner is relying on scientific theory, the Examiner must still provide evidentiary support for such a theory. MPEP 2144.02 states:

The rationale to support a rejection under 35 U.S.C. 103 may rely on logic and sound scientific principle. *In re Soli*, 317 F.2d 941, 137 USPQ 797 (CCPA 1963). However, when an examiner relies on a scientific theory, evidentiary support for the existence and meaning of that theory must be provided. *In re Grose*, 592 F.2d 1161, 201 USPQ 57 (CCPA 1979).

Emphasis added. In addition to the above statement of obviousness, the only other obviousness statement made by the Examiner is as follows:

It would have been obvious to one having ordinary skill in the art at the time the invention was made to employ a heater as taught by Phillips et al., modifying the individual heating elements disclosed by Wise et al. and employing them within the channels of the pre-concentrator of the fluid analyzer disclosed by both Wise et al. and Rounbehler et al., thus providing a fluid analyzer to provide "thermal modulation to accumulate and focus, refocus and then accelerate a concentration pulse in the carrier stream" without the loss of orthogonality (Phillips et al.: col. 4, lines 55-69).

Emphasis added; see page 8, lines 16-22 of Office Action mailed December 8, 2006.

The Examiner also asserts that it would have been obvious to one of ordinary skill in the art to modify the individual heating elements taught by Wise et al. and use instead the heater of Philips et al. within the channels of the pre-concentrator of Wise et al. to provide thermal modulation to accumulate and focus, refocus and then accelerate a concentration pulse in the carrier stream without the loss of orthogonality. Applicants respectfully disagree.

The following arguments regarding the significant differences in the technology of the Phillips et al. device as compared to Wise et al. and Rounbehler et al. have been repeated in the responses filed March 7, 2006, July 14, 2006, and November 21, 2006, but the Examiner has not yet addressed these arguments. Applicants once again request that if this rejection is maintained, a response to the following arguments be provided in the next Office Action.

Philips et al. teach a two-dimensional chromatography system in which thermal modulation is used to focus, refocus and accelerate a concentration pulse through two dimensions to separate chemical components of a sample. See column 4, lines 38-59. Loss of orthogonality is important in the two-dimensional chromatography of Philips et al. Orthogonality relates to intersecting or things lying at right angles, which is important and relevant to the two-dimensional chromatography of Phillips et al., but does not appear to have any relation or importance to the systems of Wise et al. or Rounbehler et al. The gas chromatographs of Wise et al. and Rounbehler et al. do not, however, involve a two-dimensional separation, thus the Examiner's asserted motivation for combining Philips et al. with Wise et al. and Rounbehler et al. is clearly based on Applicants' specification, which is improper. The methodologies and systems of Wise et al. and Philips et al. are vastly different and Applicants submit that there is no motivation for combining their teachings.

Additionally, it is not clear how one of ordinary skill in the art would accomplish such a combination. Philips et al. teach a device in which the outlet of a first column is connected to the inlet of a second column. The thermal modulator is taught as being connected between the outlet of the sample injection device and the inlet of the first column or between the outlet of the first



column and the inlet of the second column. See column 5, line 43 through column 6, line 5. It is not clear how the thermal modulator of Philips et al. would be connected to the micro-gas chromatograph of Wise et al.

Regarding the rejection of claims 6-8, 22, 23, 26, and 31, the Examiner asserts that the employment of multiple pumps and detectors at any desired location of a fluid analyzer "would be considered well within the skill set of one of ordinary skill in the art" (see page 9, lines 4-5 of Office Action mailed December 8, 2006). The Examiner's assertion of obviousness is based on improper grounds. MPEP 2143.01 IV states:

A statement that modifications of the prior art to meet the claimed invention would have been "well within the ordinary skill of the art at the time the claimed invention was made" because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a prima facie case of obviousness without some objective reason to combine the teachings of the references. *Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993). See also *In re Kotzab*, 217 F.3d 1365, 1371, 55 USPQ2d 1313, 1318 (Fed. Cir. 2000) (Court reversed obviousness rejection involving technologically simple concept because there was no finding as to the principle or specific understanding within the knowledge of a skilled artisan that would have motivated the skilled artisan to make the claimed invention); *Al-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999) (The level of skill in the art cannot be relied upon to provide the suggestion to combine references.).

Emphasis added. If this rejection is maintained, the Examiner is respectfully requested to provide some objective reason to combine the teachings of Wise et al., Rounbehler et al., and Phillips et al., other than merely that such a combination could be achieved because it is "well within the skill set of one of ordinary skill in the art".

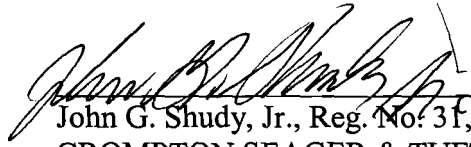
Applicants submit that there is no motivation to combine the teachings of Wise et al. with either Rounbehler et al. or Philips et al., and that even if one were to make such a combination, the resulting device would not appear to operate as taught by Wise et al. Additionally, such a combination would not result in the device presently claimed. Reconsideration and withdrawal of the rejection are respectfully requested.

Application Serial No. 10/672,483  
Response to Office Action mailed December 8, 2006  
Amendment dated , 2007

Reconsideration and reexamination are respectfully requested. It is submitted that, in light of the above remarks, all pending claims 1-9 and 21-31 are now in condition for allowance. If a telephone interview would be of assistance, please contact the undersigned attorney at 612-677-9050.

Respectfully submitted,

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